

Response Costs Associated with Delaware Oil Spill Events

Project Overview

In the event of an offshore oil spill, a quick and efficient response is necessary to minimize damages to socioeconomic and ecological resources both in the water and along the coastline. The level of response required for a particular spill event, and the corresponding costs associated with response team mobilization, is heavily dependent on the size of the spill itself, as well as the type of oil spilled, the speed and direction of winds and currents at the time of the spill, proximity to and characteristics of the nearest coastline, and the selected mitigation strategy.

To better understand the range of potential response costs the State of Delaware might incur in the event of a spill, DNREC examined the potential impacts associated with several hypothetical surface spills occurring off Delaware's coast, defined according to spill size, season of the year during which the spill occurs, and whether mitigation measures such as mechanical removal are implemented to minimize spill impacts. Results for the five different spill scenarios provide key insights into the findings of the analysis.

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Scenario 1: 200,000-barrel spill in the summer, without mitigation measures

Scenario 2: 200,000-barrel spill in the summer, with mitigation measures

Scenario 3: 126-barrel spill in the summer, without mitigation measures

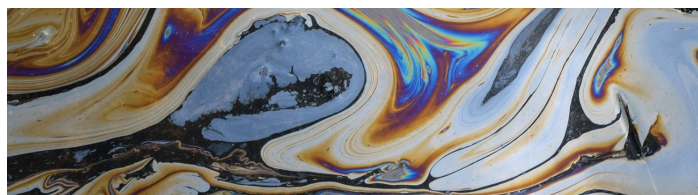
Scenario 4: 200,000-barrel spill in the winter, without mitigation measures

Scenario 5: 2,240-barrel spill in the summer, without mitigation measures

Approach for Assessing Response Costs

To determine the potential response costs faced by the State of Delaware, a "response cost per barrel of oil spilled" value or range of values was estimated for each scenario. For the 126- and 2,240-barrel spills specified above, damages per barrel were obtained from a response cost function developed by Etkin (2004) based on data for several thousand spills in the U.S.¹ Drawing on data for spills occurring over more than two decades, this function considers the quantity and type of oil spilled, the removal technique used, and characteristics of the affected shoreline environment. Because this response cost function was based on historical spills of less than 25,000 barrels, a separate range of response costs per barrel was developed for large spills (200,000 barrels) based on response costs incurred following the *Exxon Valdez* and *Deepwater Horizon* oil spills.

For each individual scenario, response costs specific to Delaware were calculated based on the fraction of surface oiling within the Delaware coastal zone relative to the surface oiling along all coastal states in the region. These response costs specific to Delaware were then allocated between the responsible party for the spill and the public, based on historical data on the allocation of the response cost burden between the responsible party and government agencies (74% responsible party and 26% government). Drawing on additional historical data maintained by the U.S. Coast Guard, the government response cost burden was split between the federal government and state governments (federal 60% and states 40%). Based on these allocation percentages, the State of Delaware was assumed to incur approximately 10.4% of the response costs associated with surface oiling in Delaware waters.



¹Dagmar Schmidt Etkin. 2004. *Modeling Oil Spill Response and Damage Costs*, prepared for U.S. Environmental Protection Agency.

Estimated Response Costs to Delaware State Agencies

Exhibit 1 presents the estimated response costs incurred by government agencies in the State of Delaware for each of the five oil spill scenarios outlined above. The range shown for each spill scenario reflects the range of per-barrel response costs derived from the approach outlined above. As shown in the exhibit, response costs are highest under the unmitigated 200,000-barrel summer spill. At the other end of the spectrum, response costs for oiling in the Delaware coastal zone are estimated as \$0 for the 126-barrel spill scenario. In actuality, individual spills of approximately 126 barrels could result in response costs related to oiling in Delaware's coastal zone, but the oil spill modeling supporting this analysis suggests that 126-barrel spills in the specific locations chosen would likely result in little to no response for oiling along Delaware's shoreline. Exhibit 1 also shows no response cost impact for Delaware under the 200,000-barrel spill occurring during the winter. This is due to the winds and currents assumed for this scenario, which push spilled oil southward. The more limited response costs for the 2,240-barrel spill reflect the much lower volume of oil associated with this spill relative to the larger spills.

Exhibit 1 also highlights that mitigation can reduce the response costs incurred by the State. Based on the mitigation measures modeled for this analysis, mitigation reduces response costs by approximately 23 to 50%. Additional details on DNREC's analysis of oil spill impacts to Delaware's economy, including results for additional oil spill scenarios, are available in the [full oil spill risk assessment report](#).

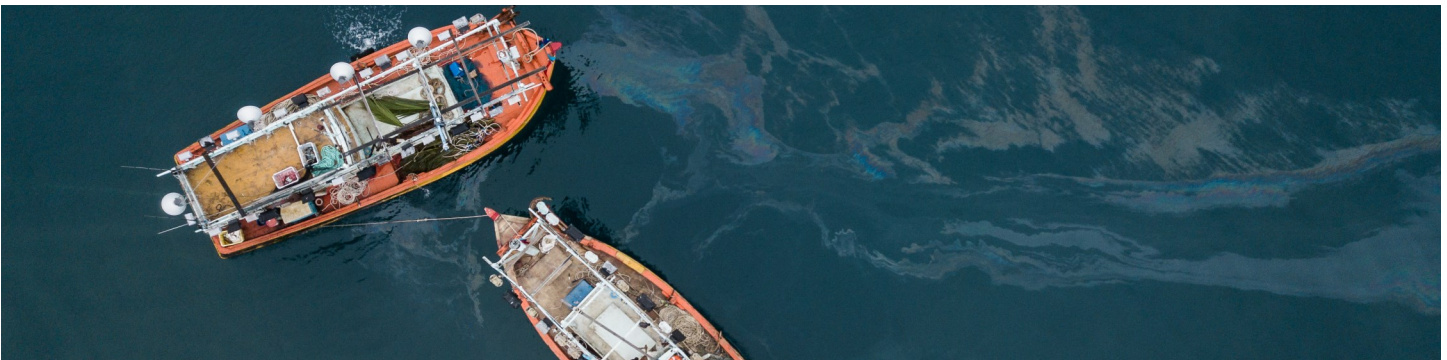
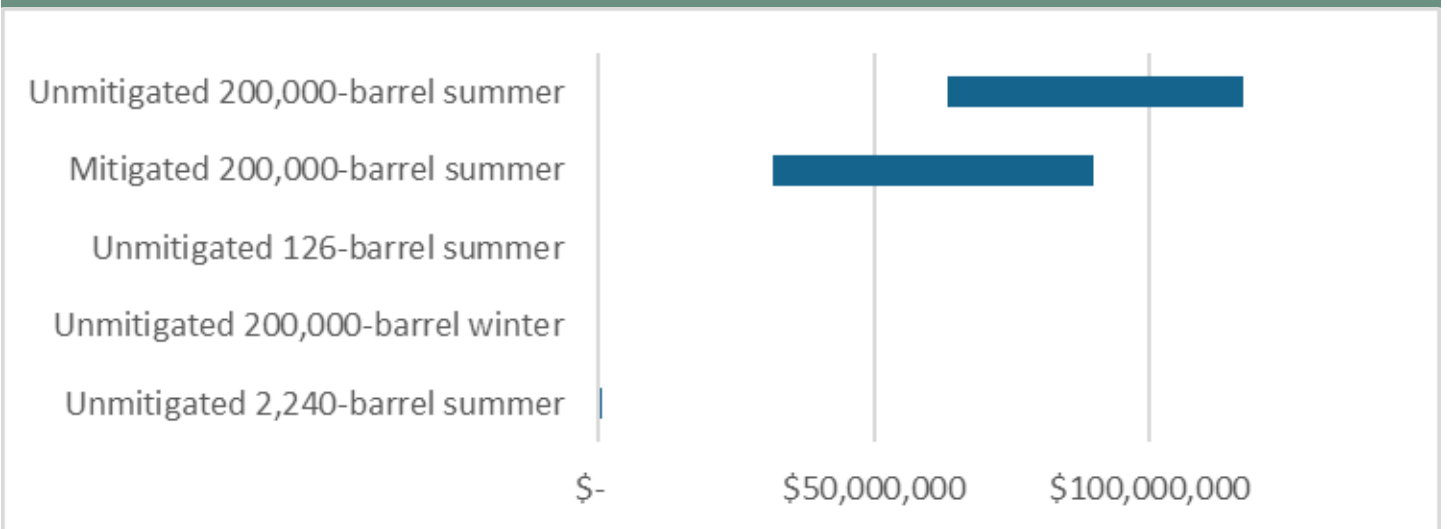


Exhibit 1. Oil Spill Response Costs Incurred by Delaware State Agencies



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